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Fear of climate change consequences and predictors of intentions to alter meat consumption

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ABSTRACT

Reducing or altering meat consumption has the potential to significantly lower the impact humans have on climate change. Consumers, however, are unlikely to break their food habits unless they are aware of the problem and motivated by the solutions. Fear appeals are often used to overcome this, however, their effectiveness in the context of meat reduction and climate change is unclear. Given the widespread use of fear appeals in information policy, it is important to understand more. The aim of this study was to explore fear—or more specifically—the danger control process in a climate change—food context in order to understand the factors which motivate consumers to reduce or alter their meat consumption. Using a stratified random sample of 222 respondents in Southern Sweden, we develop a model for predicting intentions to adopt specific and general actions to reduce or alter meat consumption. Our results suggest that the general key to motivating consumers is through increasing their self-efficacy towards adopting meat alternatives and educating them on the importance their actions have in reducing the threat. We also found that appraising the threat to self (or those close) was significant, but surprisingly the effect size was greater when the threat concerned others (e.g. others in impoverished nations, animals).

1. Introduction

Food production is a major contributor of anthropogenic climate change with effects comparable to those from the transportation and housing sector (Tukker and Jansen, 2008). Greenhouse gas (GHG) emissions generated in the food chain are the major cause and vary depending on what is produced—with animal products, especially beef, having substantially higher carbon footprints than plant-based foods (Nijdam et al., 2012). Emission of GHG are between 20 and 55% lower in vegetarian and vegan diets and up to 35% lower when meat consumption is reduced and red meats avoided (Hallström et al., 2014, 2015). Given this, reduced or altered meat consumption has the potential to significantly lower the impact humans have on climate change (Garnett, 2011; González et al., 2011; Smith and Gregory, 2013).

Consumers resist changes in diet for a variety of reasons including taste preferences and traditions (see e.g., de Bakker and Dagevos, 2012; de Boer et al., 2013; Schösler et al., 2012; Vanhonacker et al., 2013). With climate change and food, there are additional barriers involved such as low general awareness of their connection and which food related behaviors are most culpable (Lea and Worsley, 2008; Macdiarmid et al., 2016). Arguably, consumers will not voluntarily change their food behavior for the sake of preventing climate change unless they are aware of the connection, motivated by it, and have help lowering the barriers to realizing it (Moser and Dilling, 2011). They can be coerced into making these food changes through direct price intervention, taxation, and limiting access (Capacci et al., 2012), however government policy rarely leverages such tools because they are deeply unpopular with consumers and not without political risk (Edjabou and Smed, 2013; Jagers and Matti, 2010; Mazzocchi et al., 2015; Owens and Driffill, 2008; Säll and Gren, 2015). Reflecting this, policy to influence consumption habits is so far largely restricted to attitude change through information sharing (Owens and Driffill, 2008). Similarly, but for different reasons, NGOs, private citizens, and other stakeholders use information to build awareness, educate, and communicate the dangers of climate change (Anderson, 2009; Gadema and Oglethorpe, 2011; Nerlich et al., 2010).

Fear appeals (sometimes called threat appeals) represent the dominant communications approach used to raise awareness about environmental issues and motivate behavioral change (O'Neill and Nicholson-Cole, 2009). Communicators have used images of polar bears sitting on melting ice-caps, droughts, flooding and more recently terrorism to instill fear (Asplund et al.,

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2013; O'Neill et al., 2013) and encourage climate friendly behavior (cf. Spence and Pidgeon, 2010). However, most of these communications have targeted behaviors other than food choice (e.g. turning off appliances when not in use; see Cismaru et al., 2011) and research on their efficacy in the context of climate mitigating food actions is lacking (Garnett et al., 2015). It is well established that fear appeals promote danger control[1] processes (i.e. motivation to avert the danger or threat) which (sometimes) result in attitude, intention, or behavioral change (Milne et al., 2000). However the outcome of this process depends on several cognitive factors—including the perceived seriousness of the threat and susceptibility, costs involved, self-efficacy and response efficacy of the proposed actions (Rogers, 1983; Ruiter et al., 2001). For example, even if an individual is motivated by fear to take action, they may not alter their meat consumption because they do not believe doing so is effective (i.e. response efficacy) or the costs involved too high. Because of this, studies investigating *other* behaviors and the factors which influence them, e.g. do individuals in flood prone areas proactively build on higher ground to avoid the threat of climate induced sea-level rises (see Koerth et al., 2013), may not generalize to a context where consumers are asked to adopt their eating habits to avoid the same threat (Spence and Pidgeon, 2010).

Consequently, although fear is often used to communicate climate change consequences and motivate changes in behavior, its effectiveness depends largely on danger control processes which are context specific. Danger control processes have been investigated in studies on unhealthy eating behavior—but not climate change (see e.g., Cox et al., 2004; Scarpa and Thiene, 2011), as well as studies on climate change—but not food behavior. Because motivating consumers at the policy and advocacy level continue to rely heavily on information sharing, voluntary changes, and fear, a better understanding of the danger control process in a climate change—food behavior context is important. This will help policy makers and climate advocates target the factors which motivate changes in GHG intensive diets and help reduce the cognitive barriers to realizing them (Fischhoff, 2007). Therefore, the overall aim of this study was to explore the danger control process in a climate change—food context in order to understand the factors which motivate consumers to reduce or alter their meat consumption.

The remainder of this study is structured as follows: In the next section we describe what fear appeals are and explain how they (sometimes) influence intended behavioral change with the help of protection motivation theory. Following this, we discuss why using fear appeals and threats in a climate mitigating food context may not work today and develop the idea that it is nevertheless important to understand why. In the methodology section, we operationalize and test a model used to predict intentions to reduce or replace meat consumption before discussing ways for policy and practice to improve their climate change communications.

2. Theory

2.1. How fear appeals might influence behavior

Fear appeals often take the form of a persuasive communication whereby two types of information are presented (Ruiter et al., 2001; Witte, 1992). The first is a threat that is both serious and relevant for the receiver. The second concerns what can be done to protect against the threat. Fear appeals trigger one of two, parallel cognitive processes: A danger control process which results in adaptive behaviors depending on the perceived seriousness, susceptibility, response and self-efficacy and costs involved in reducing the threat, or in fear control processes in which the threat is denied (or managed) and risk behavior continued (Rogers, 1983; Ruiter et al., 2001; Witte, 1992). Faced with the threat of climate change, why would an individual adopt climate mitigating food actions? Protection motivation theory (PMT) suggests that this can be predicted by knowing how individuals appraise and cope with the threat. Threat appraisal includes how severe the consequences of the threat are (severity) and how probable it is that the threat will affect the appraiser (vulnerability). Coping appraisal is a combination of how effective a recommended action is in preventing negative consequences of the threat (response efficacy), to what extent the appraiser is able to perform the recommended action (self-efficacy), and at what cost (response cost) (Boer and Seydel, 1996).

PMT has been applied to studies on smoking (Pechmann et al., 2003), genetic testing for breast cancer (Helmes, 2002), exercise and diabetes (Plotnikoff et al., 2010), driver safety (Lewis et al., 2007), energy conservation (Hass et al., 1975) and even to explain intentions behind functional and organic food consumption (Cox et al., 2004; Scarpa and Thiene, 2011). A meta-analysis of 65 studies that included over 20 different health issues found that PMT variables exerted moderate effects in general; however, there were salient differences depending on the behavior targeted. Therefore, understanding the relative impact of key variables is important for developing persuasive communications (Floyd et al., 2000).

2.2. Protection motivation in a climate change context

Recent empirical studies suggest most consumers are not willing to make the important food change of reducing meat (Vanhonacker et al., 2013); especially those who find the climate change premise unconvincing (de Boer et al., 2013). Adding to this, food itself is not something that most people associate with climate change (Bostrom et al., 2012). Certain segments of the population (labeled flexitarians) are willing to try alter their meat consumption (de Bakker and Dagevos, 2012), albeit with actions where psychic and other costs are lower—such as switching from beef to other forms of animal protein; as opposed to drastic moves such as what animal to plant based protein entails (Schösler et al., 2012).

Climate change is qualitatively different from other environmental problems such as water pollution because it involves invisible causes and distant impacts, and is therefore more difficult to communicate (Moser, 2010). Hence, protection motivation is arguably even lower in a climate change *mitigation* context. Adaptation concerns taking measures to protect oneself or society from the consequences of climate change—such as building barriers to prevent flooding of one's house (Koerth et al., 2013). However, climate adaptation measures have more in common with health related behaviors as both reduce direct personal risk, than do climate change *mitigating* behaviors which deal with actions to reduce GHGs to avoid further increased climate change. The recommended protective action to mitigate GHG emissions with food consumption tested here, reduced or changed meat consumption, require large penetration across the population to be effective. Milinski et al. (2007) frames this as the 'collective-risk social dilemma' which describes the difficulties for a group of people to reach a collective target through individual sacrifices. As a result, while fear appeals are extensively used to communicate climate change threats, it is unclear whether they motivate individuals to change their dietary choices—nor can we be sure why.

Therefore, as de Boer et al. (2013) and others (see e.g. Garnett et al., 2015) argue, studying what motivates people to adopt

[1] Fear appeals can also stimulate a parallel process known as "fear control" where instead of taking action (cognitive, affective, or behavioral) to avert the threat/danger, individuals manage their fear (Witte, 1992).